What is claimed is:

1. An artificial intervertebral disc prosthesis having an anterior portion and a posterior portion, comprising:

a first endplate having an upper surface and a lower surface, said first endplate further comprising at least one opening for receiving at least one motion-limiting member;

a first projection extending from said lower surface of said first endplate terminating in a first distal end;

a second endplate having an upper surface and a lower surface, said second endplate further comprising at least one opening for receiving at least one motion-limiting member;

a second projection extending from said upper surface of said second endplate and substantially aligned with said first projection, said second projection terminating at a second distal end to form a gap having a predetermined distance between said first distal end and said second distal end;

at least one motion-limiting member received respectively in said at least one opening of said first endplate and said second endplate, said at least one motion-limiting member linking said first endplate to said second endplate and allowing only a predetermined amount of movement of said first endplate relative to said second endplate; and

a visco-elastic cushion interposed between said first endplate and said second endplate, further comprising therein at least one cavity in substantial alignment with said at least one opening in said first endplate and said second endplate through which said motion-limiting member may pass and at least one cavity surrounding said first and second projections.

2. The artificial intervertebral disc prosthesis of Claim 1 wherein said first endplate further comprises a first subplate having an upper surface and a lower surface and at least one opening therethrough for respectively receiving said at least one motion-limiting member, wherein said first projection of said first endplate extends from said lower surface of said upper subplate.

3. The artificial intervertebral disc prosthesis of Claim 1 wherein said second endplate further comprises a second subplate having an upper surface and a lower surface, wherein

said second projection of said second endplate extends from said upper surface of said lower endplate.

4. The artificial intervertebral disc prosthesis of Claim 1 wherein said at least one opening of said upper endplate has a first diameter near said upper surface of said first endplate and a second diameter at said lower surface of said first endplate, wherein said first diameter is greater than said second diameter.

5. The artificial intervertebral disc prosthesis of Claim 1 wherein said at least one opening of said second endplate has a third diameter at said lower surface of said second endplate and a fourth diameter at said upper surface of said second endplate, wherein said third diameter is greater than said fourth diameter.

6. The artificial intervertebral disc prosthesis of Claim 1 wherein said first projection of said first endplate extends a distance of approximately 1 to approximately 3 millimeters from said lower surface of said first endplate.

7. The artificial intervertebral disc prosthesis of Claim 1 wherein said first projection of said first endplate is substantially cylindrically shaped.

8. The artificial intervertebral disc prosthesis of Claim 1 wherein said first distal end has a radius of approximately 2 millimeters to approximately 15 millimeters.

9. The artificial intervertebral disc prosthesis of Claim 1 wherein said second projection of said second endplate extends a distance of approximately 3 millimeters to approximately 6 millimeters from said upper surface of said second endplate to said second distal end.

10. The artificial intervertebral disc prosthesis of Claim 1 wherein said gap between said first distal end and said second distal end is approximately 1 millimeters to approximately 2 millimeters.

11. The artificial intervertebral disc prosthesis of Claim 1 wherein said motion-limiting member is a longitudinal member having a first end and a second end further comprising a first enlarged portion at said first end and a second enlarged portion at said second end.

12. The artificial intervertebral disc prosthesis of Claim 11 wherein said first enlarged portion has a diameter greater than said second diameter and wherein said second enlarged portion has a diameter greater than said third diameter.

13. The artificial intervertebral disc prosthesis of Claim 1, further comprising a split ring assembly having an upper surface and a lower surface and a through hole therein.

14. The artificial intervertebral disc prosthesis of Claim 13 wherein said split ring assembly is fitted into said at least one opening at said upper surface of said first endplate and at least one opening at said lower surface of said second endplate.

15. The artificial intervertebral disc prosthesis of Claim 14 wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said first opening of said first endplate at its lower surface.

16. The artificial intervertebral disc prosthesis of Claim 14, wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said second opening of said second endplate at its upper surface.

17. The artificial intervertebral disc prosthesis of Claim 14, wherein said motion-limiting member comprises a longitudinal member having a first end and a second end and an enlarged portion at both said first end and second end, said enlarged portions having a diameter larger than that of said aperture of said lower surface of said split ring assembly.

18. The artificial intervertebral disc prosthesis of Claim 1 wherein said upper surface of said first endplate and said lower surface of said second endplate further comprise appurtenances that aid in securing the prosthesis to the adjacent vertebra.

19. The artificial intervertebral disc prosthesis of Claim 1, further comprising a force or pressure transducer located within said prosthesis for allowing the measurement and transmittal of load information experienced by the prosthesis.

20. The artificial intervertebral disc prosthesis of Claim 19, wherein said second projection of said second endplate houses at least a portion of a package of signal conditioning and amplification electronics that is connected to said force or pressure transducers placed within said second projection or at other peripheral locations around said second endplate.

21. The artificial intervertebral disc prosthesis of Claim 19, wherein said second projection of said second endplate houses electronics that are connected to said force or pressure transducers placed within said second projection or at other peripheral locations around said second endplate.

22. The artificial intervertebral disc prosthesis of Claim 19, wherein said second endplate further comprises a flex circuit including a load or pressure sensor embedded onto said upper surface of said second endplate.

23. The artificial intervertebral disc prosthesis of Claim 1 wherein said first endplate and said second endplate are comprised of a biocompatible material suitable for implantation.

24. The artificial intervertebral disc prosthesis of Claim 23 wherein said first endplate and said second endplate are comprised of materials selected from the group consisting of stainless steel, stainless steel alloys, titanium, titanium alloys, cobalt chrome molybdenum alloys, and composite materials.

25. The artificial intervertebral disc prosthesis of Claim 24 wherein said material is an alloy comprising approximately 66 percent cobalt, approximately 28 percent chrome, and approximately 6 percent molybdenum, by weight.

26. The artificial intervertebral disc prosthesis of Claim 1 wherein said at least one opening of said first endplate and said second endplate further comprises a first opening disposed in a first medial-lateral direction of said first and said second endplates in a posterior portion

thereof, and a second opening in a second, substantially opposite medial-lateral direction of said first and said second endplates in a posterior portion thereof, wherein a motion-limiting member is received in said first and second openings.

27. The artificial intervertebral disc prosthesis of Claim 1 wherein said posterior portion of each of said first and second endplates further comprises a concavity that defines posterior lobes projecting from said posterior portions of each of said first and second endplates.

28. The artificial intervertebral disc prosthesis of Claim 27 wherein each of said first and second endplates have an external surface therearound defining a generally "D" shape.

29. The artificial intervertebral disc prosthesis of Claim 1 wherein said motion-limiting member has a length slightly greater than the total distance between said lower surface of said first endplate and said upper surface of said second endplate when said prosthesis is at rest, allowing said motion-limiting member to move within said cavity when said prosthesis is subject to loads.

30. The artificial intervertebral disc prosthesis of Claim 1 wherein said motion-limiting element is a cable.

31. The artificial intervertebral disc prosthesis of Claim 30 wherein said cable is made of 316L stainless steel, MP35N, Haynes 25.

32. An artificial intervertebral disc prosthesis having an anterior portion and a posterior portion, comprising:

a first endplate having an upper surface and a lower surface;

a first projection extending from said lower surface of said first endplate terminating in a first distal end;

a second endplate having an upper surface and a lower surface;

a second projection extending from said upper surface of said second endplate and substantially aligned with said first projection, said second projection terminating at a second distal end to form a gap having a predetermined distance between said first distal end and said second distal end; and

a visco-elastic cushion interposed between said upper and lower endplates further comprising a cavity for receiving said first and second projections.

33. The artificial intervertebral disc prosthesis of Claim 32 wherein said first projection of said first endplate extends a distance of approximately 1 to approximately 3 millimeters from said lower surface of said first endplate.

34. The artificial intervertebral disc prosthesis of Claim 32 wherein said first projection of said first endplate is substantially cylindrically shaped.

35. The artificial intervertebral disc prosthesis of Claim 32 wherein said first distal end has a radius of approximately 2 millimeters to approximately 15 millimeters.

36. The artificial intervertebral disc prosthesis of Claim 32 wherein said second projection of said second endplate extends a distance of approximately 3 millimeters to approximately 6 millimeters from said upper surface of said second endplate to said second distal end.

37. The artificial intervertebral disc prosthesis of Claim 32 wherein said gap between said first distal end and said second distal end is approximately 1 millimeters to approximately 2 millimeters.

38. The artificial intervertebral disc prosthesis of Claim 32 wherein said upper surface of said first endplate and said lower surface of said second endplate further comprise appurtenances that aid in securing the prosthesis to the adjacent vertebra.

39. The artificial intervertebral disc prosthesis of Claim 32, further comprising a force or pressure transducer located within said prosthesis for allowing the measurement and transmittal of load information experienced by the prosthesis.

40. The artificial intervertebral disc prosthesis of Claim 39, wherein said second projection of said second endplate houses at least a portion of a package of signal conditioning and amplification electronics that is connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

41. The artificial intervertebral disc prosthesis of Claim 39, wherein said second projection of said second endplate houses electronics connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

42. The artificial intervertebral disc prosthesis of Claim 39, wherein said second endplate further comprises a flex circuit including a load sensor embedded onto said upper surface of said second endplate.

43. The artificial intervertebral disc prosthesis of Claim 32 wherein said first endplate and said second endplate are comprised of a biocompatible material suitable for implantation.

44. The artificial intervertebral disc prosthesis of Claim 43 wherein said first endplate and said second endplate are comprised of materials selected from the group consisting of stainless steel, stainless steel alloys, titanium, titanium alloys, cobalt chrome molybdenum alloys, and composite materials.

45. The artificial intervertebral disc prosthesis of Claim 44 wherein said material is an alloy comprising approximately 66 percent cobalt, approximately 28 percent chrome, and approximately 6 percent molybdenum, by weight.

46. The artificial intervertebral disc prosthesis of Claim 32 wherein said posterior portion of each of said first and second endplates further comprises a concavity that defines posterior lobes projecting from said posterior portions of each of said first and second endplates.

47. The artificial intervertebral disc prosthesis of Claim 46 wherein each of said first and second endplates have an external surface therearound defining a generally "D" shape.

48. An artificial intervertebral disc prosthesis having an anterior portion and a posterior portion, comprising:

a first endplate having an upper surface and a lower surface, said first endplate further comprising at least one opening for receiving at least one motion-limiting member;

a second endplate having an upper surface and a lower surface, said second endplate further comprising at least one opening for receiving at least one motion-limiting member;

at least one motion-limiting member received respectively in said at least one opening of said first and second endplates, said at least one motion-limiting member connecting said first endplate to said second endplate and allowing only a predetermined amount of movement of said first endplate relative to said second endplate; and

a visco-elastic cushion between said lower surface of said upper endplate and said upper surface of said lower endplate, further comprising therein at least one cavity in substantial alignment with said at least one opening in said first and second endplates through which said at least one motion-limiting member may respectively pass.

49. The artificial intervertebral disc prosthesis of Claim 48 wherein said first endplate further comprises a first subplate having an upper surface and a lower surface and at least one opening therethrough for respectively receiving said at least one motion-limiting member, wherein said first projection of said first endplate extends from said lower surface of said upper subplate.

50. The artificial intervertebral disc prosthesis of Claim 48 wherein said second endplate further comprises a second subplate having an upper surface and a lower surface, wherein said second projection of said second endplate extends from said upper surface of said lower endplate.

51. The artificial intervertebral disc prosthesis of Claim 48 wherein said at least one opening of said upper endplate has a first diameter near said upper surface of said first endplate and a second diameter at said lower surface of said first endplate, wherein said first diameter is greater than said second diameter.

52. The artificial intervertebral disc prosthesis of Claim 48 wherein said at least one opening of said second endplate has a third diameter at said lower surface of said second endplate and a fourth diameter at said upper surface of said second endplate, wherein said third diameter is greater than said fourth diameter.

53. The artificial intervertebral disc prosthesis of Claim 48 wherein said motion-limiting member is a longitudinal member having a first end and a second end further comprising a first enlarged portion at said first end and a second enlarged portion at said second end.

54. The artificial intervertebral disc prosthesis of Claim 53 wherein said first enlarged portion has a diameter greater than said second diameter and wherein said second enlarged portion has a diameter greater than said third diameter.

55. The artificial intervertebral disc prosthesis of Claim 48, further comprising a split ring assembly having an upper surface and a lower surface and a through hole therein.

56. The artificial intervertebral disc prosthesis of Claim 55 wherein said split ring assembly is fitted into said at least one opening at said upper surface of said first endplate and at least one opening at said lower surface of said second endplate.

57. The artificial intervertebral disc prosthesis of Claim 56 wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said first opening of said first endplate at its lower surface.

58. The artificial intervertebral disc prosthesis of Claim 56, wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said second opening of said second endplate at its upper surface.

59. The artificial intervertebral disc prosthesis of Claim 56, wherein said motion-limiting member comprises a longitudinal member having a first end and a second end and an enlarged portion at both said first end and second end, said enlarged portions having a diameter larger than that of said aperture of said lower surface of said split ring assembly.

60. The artificial intervertebral disc prosthesis of Claim 48 wherein said upper surface of said first endplate and said lower surface of said second endplate further comprise appurtenances that aid in securing the prosthesis to the adjacent vertebra.

61. The artificial intervertebral disc prosthesis of Claim 48, further comprising a force or pressure transducer located within said prosthesis for allowing the measurement and transmittal of load information experienced by the prosthesis.

62. The artificial intervertebral disc prosthesis of Claim 61, wherein said second projection of said second endplate houses at least a portion of a package of signal conditioning and amplification electronics that is connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

63. The artificial intervertebral disc prosthesis of Claim 61, wherein said second projection of said second endplate houses electronics that are connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

64. The artificial intervertebral disc prosthesis of Claim 61, wherein said second endplate further comprises a flex circuit including a load sensor embedded onto said upper surface of said second endplate.

65. The artificial intervertebral disc prosthesis of Claim 48 wherein said first endplate and said second endplate are comprised of a biocompatible material suitable for implantation.

66. The artificial intervertebral disc prosthesis of Claim 65 wherein said first endplate and said second endplate are comprised of materials selected from the group consisting of stainless steel, stainless steel alloys, titanium, titanium alloys, cobalt chrome molybdenum alloys, and composite materials.

67. The artificial intervertebral disc prosthesis of Claim 66 wherein said material is an alloy comprising approximately 66 percent cobalt, approximately 28 percent chrome, and approximately 6 percent molybdenum, by weight.

68. The artificial intervertebral disc prosthesis of Claim 48 wherein said at least one opening of said first endplate and said second endplate further comprises a first opening disposed in a left lateral direction in a transverse plane of said first and said second endplates in a posterior portion thereof, and a second opening in a second, substantially opposite right lateral direction in a transverse plane of said first and said second endplates in a posterior portion thereof, wherein a motion-limiting member is received in said first and second openings.

69. The artificial intervertebral disc prosthesis of Claim 48 wherein said posterior portion of each of said first and second endplates further comprises a concavity that defines posterior lobes projecting from said posterior portions of each of said first and second endplates.

70. The artificial intervertebral disc prosthesis of Claim 69 wherein each of said first and second endplates have an external surface therearound defining a generally "D" shape.

71. The artificial intervertebral disc prosthesis of Claim 48 wherein said motion-limiting member has a length slightly greater than the total distance between said lower surface of said first endplate and said upper surface of said second endplate when said prosthesis is at rest, allowing said motion-limiting member to move within said cavity when said prosthesis is subject to loads.

72. The artificial intervertebral disc prosthesis of Claim 48 wherein said motion-limiting element is a cable.

73. The artificial intervertebral disc prosthesis of Claim 72 wherein said cable is made of 316L stainless steel, MP35N, Haynes 25.

74. An artificial intervertebral disc prosthesis having an anterior portion and a posterior portion, comprising:

a first endplate having an upper surface and a lower surface, said first endplate further comprising at least one opening for receiving at least one motion-limiting member;

a second endplate having an upper surface and a lower surface, said second endplate further comprising at least one opening for receiving at least one motion-limiting member;

a projection extending from said upper surface of said second endplate and substantially aligned with said first projection, said projection terminating at a distal end to form a gap having a predetermined distance between said lower surface of said first endplate and said distal end;

at least one motion-limiting member received respectively in said at least one opening of said first endplate and said second endplate, said at least one motion-limiting member linking said first endplate to said second endplate and allowing only a predetermined amount of movement of said first endplate relative to said second endplate; and

a visco-elastic cushion interposed between said first endplate and said second endplate, further comprising therein at least one cavity in substantial alignment with said at least one opening in said first endplate and said second endplate through which said motion-limiting member may pass.

75. The artificial intervertebral disc prosthesis of Claim 74 wherein said first endplate further comprises a first subplate having an upper surface and a lower surface and at least one opening therethrough for respectively receiving said at least one motion-limiting member.

76. The artificial intervertebral disc prosthesis of Claim 74 wherein said second endplate further comprises a second subplate having an upper surface and a lower surface, wherein said projection of said second endplate extends from said upper surface of said lower endplate.

77. The artificial intervertebral disc prosthesis of Claim 74 wherein said at least one opening of said upper endplate has a first diameter near said upper surface of said first

endplate and a second diameter at said lower surface of said first endplate, wherein said first diameter is greater than said second diameter.

78. The artificial intervertebral disc prosthesis of Claim 74 wherein said at least one opening of said second endplate has a third diameter at said lower surface of said second endplate and a fourth diameter at said upper surface of said second endplate, wherein said third diameter is greater than said fourth diameter.

79. The artificial intervertebral disc prosthesis of Claim 74 wherein said projection of said second endplate extends a distance of approximately 3 millimeters to approximately 6 millimeters from said upper surface of said second endplate to said distal end.

80. The artificial intervertebral disc prosthesis of Claim 74 wherein said gap between said distal end and said lower surface of said first endplate is approximately 1 millimeters to approximately 2 millimeters.

81. The artificial intervertebral disc prosthesis of Claim 74 wherein said motion-limiting member is a longitudinal member having a first end and a second end further comprising a first enlarged portion at said first end and a second enlarged portion at said second end.

82. The artificial intervertebral disc prosthesis of Claim 81 wherein said first enlarged portion has a diameter greater than said second diameter and wherein said second enlarged portion has a diameter greater than said third diameter.

83. The artificial intervertebral disc prosthesis of Claim 74, further comprising a split ring assembly having an upper surface and a lower surface and a through hole therein.

84. The artificial intervertebral disc prosthesis of Claim 83 wherein said split ring assembly is fitted into said at least one opening at said upper surface of said first endplate and at least one opening at said lower surface of said second endplate.

85. The artificial intervertebral disc prosthesis of Claim 84 wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said first opening of said first endplate at its lower surface.

86. The artificial intervertebral disc prosthesis of Claim 84, wherein said through hole at said lower surface of said split ring assembly has a smaller diameter than said second opening of said second endplate at its upper surface.

87. The artificial intervertebral disc prosthesis of Claim 84, wherein said motion-limiting member comprises a longitudinal member having a first end and a second end and an enlarged portion at both said first end and second end, said enlarged portions having a diameter larger than that of said aperture of said lower surface of said split ring assembly.

88. The artificial intervertebral disc prosthesis of Claim 74 wherein said upper surface of said first endplate and said lower surface of said second endplate further comprise appurtenances that aid in securing the prosthesis to the adjacent vertebra.

89. The artificial intervertebral disc prosthesis of Claim 74, further comprising a force or pressure transducer located within said prosthesis for allowing the measurement and transmittal of load information experienced by the prosthesis.

90. The artificial intervertebral disc prosthesis of Claim 89, wherein said second projection of said second endplate houses at least a portion of a package of signal conditioning and amplification electronics that is connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

91. The artificial intervertebral disc prosthesis of Claim 89, wherein said second projection of said second endplate houses electronics that are connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

92. The artificial intervertebral disc prosthesis of Claim 89, wherein said second endplate further comprises a flex circuit including a load sensor embedded onto said upper surface of said second endplate.

93. The artificial intervertebral disc prosthesis of Claim 74 wherein said first endplate and said second endplate are comprised of a biocompatible material suitable for implantation.

94. The artificial intervertebral disc prosthesis of Claim 93 wherein said first endplate and said second endplate are comprised of materials selected from the group consisting of stainless steel, stainless steel alloys, titanium, titanium alloys, cobalt chrome molybdenum alloys, and composite materials.

95. The artificial intervertebral disc prosthesis of Claim 94 wherein said material is an alloy comprising approximately 66 percent cobalt, approximately 28 percent chrome, and approximately 6 percent molybdenum, by weight.

96. The artificial intervertebral disc prosthesis of Claim 74 wherein said at least one opening of said first endplate and said second endplate further comprises a first opening disposed in a first lateral direction in a transverse plane of said first and said second endplates in a posterior portion thereof, and a second opening in a second, substantially opposite lateral direction in a transverse plane of said first and said second endplates in a posterior portion thereof, wherein a motion-limiting member is received in said first and second openings.

97. The artificial intervertebral disc prosthesis of Claim 74 wherein said posterior portion of each of said first and second endplates further comprises a concavity that defines posterior lobes projecting from said posterior portions of each of said first and second endplates.

98. The artificial intervertebral disc prosthesis of Claim 97 wherein each of said first and second endplates have an external surface therearound defining a generally "D" shape.

99. The artificial intervertebral disc prosthesis of Claim 74 wherein said motion-limiting member has a length slightly greater than the total distance between said lower surface of

said first endplate and said upper surface of said second endplate when said prosthesis is at rest, allowing said motion-limiting member to move within said cavity when said prosthesis is subject to loads.

100. The artificial intervertebral disc prosthesis of Claim 74 wherein said motion-limiting element is a cable.

101. The artificial intervertebral disc prosthesis of Claim 100 wherein said cable is made of 316L stainless steel, MP35N, Haynes 25.

102. An artificial intervertebral disc prosthesis having an anterior portion and a posterior portion, comprising:

a first endplate having an upper surface and a lower surface, said first endplate further comprising at least one opening for receiving at least one motion-limiting member;

a first projection extending from said lower surface of said first endplate terminating in a first distal end;

a second endplate having an upper surface and a lower surface, said second endplate further comprising at least one opening for receiving at least one motion-limiting member;

a second projection extending from said upper surface of said second endplate and substantially aligned with said first projection, said second projection terminating at a second distal end to form a gap having a predetermined distance between said first distal end and said second distal end;

at least one motion-limiting member received respectively in said at least one opening of said first endplate and said second endplate, said at least one motion-limiting member linking said first endplate to said second endplate and allowing only a predetermined amount of movement of said first endplate relative to said second endplate;

a visco-elastic cushion interposed between said first endplate and said second endplate, further comprising therein at least one cavity in substantial alignment with said at least one opening in said first endplate and said second endplate through which said motion-limiting member may pass; and

a force or pressure transducer located within the prosthesis for allowing the measurement and transmittal of the load experienced by the prosthesis.

103. The artificial intervertebral disc prosthesis of Claim 102 wherein said second projection of said second endplate houses a package of signal conditioning and amplification electronics that is connected to said force or pressure transducers placed within said second projection and at other peripheral locations around said second endplate.

104. The artificial intervertebral disc prosthesis of Claim 102 wherein said signal amplification electronics include an internal coil that may be excited by an inductively coupled external coil.

105. The artificial intervertebral disc prosthesis of Claim 102 wherein said package of electronics includes a data storage element for storing load data experienced by the prosthesis.

106. The artificial intervertebral disc prosthesis of Claim 105, wherein data stored in said data storage element may be retrieved by a preset sampling routine.

107. The artificial intervertebral disc prosthesis of Claim 105, wherein data stored in said data storage element may be retrieved remotely and wirelessly via the internet.

108. The artificial intervertebral disc prosthesis of Claim 105, wherein said power source for said data storage element is a micro battery.

109. The artificial intervertebral disc prosthesis of Claim 104, wherein said power source for the data storage element is a capacitor charged from an external inductive couple.

110. The artificial intervertebral disc prosthesis of Claim 102 wherein said force or pressure transducer is connected to electronics needing no signal conditioning or amplification circuitry for measuring or transmitting loads experienced by said prosthesis.